WHAT IS CLAIMED IS:

1. A radiation treatment apparatus comprising:

a radiation generating unit that emits radiation;

a guide that moves the radiation generating unit along an orbit with a predetermined radius about an isocenter such that the emitted radiation crosses at one point; and

a support member that rotates the guide about a turning axis extended through the isocenter and arranged in parallel with a plane defined by the orbit.

2. The radiation treatment apparatus according to claim 1, wherein the guide has a movable member that rotatably supports the radiation generating unit on two rotational axes crossing each other.

3. The radiation treatment apparatus according to claim 1, wherein the movable member is disposed on at least a pair of rails provided on the guide.

4. The radiation treatment apparatus according to claim 1, wherein the guide has a range of movement of the radiation generating unit, which is greater than a range that permits the radiation generating unit to emit the radiation to the isocenter in opposite directions.

5. The radiation treatment apparatus according to claim 1, wherein the guide is supported by the support member at one portion on the turning axis.

6. The radiation treatment apparatus according to

claim 1, wherein the guide is supported by the support members at two portions on the turning axis on both sides of the isocenter.

7. The radiation treatment apparatus according to claim 1, wherein the guide is provided in an arcuate shape and is supported by the support member on a turning axis horizontally extending through the isocenter.

8. The radiation treatment apparatus according to claim 1, wherein the guide is provided in an arcuate shape and is supported by the support member on a turning axis vertically extending through the isocenter.

9. The radiation treatment apparatus according to claim 1, wherein the guide is provided in an annular shape and is supported by the support member on a turning axis horizontally extending through the isocenter.

10. The radiation treatment apparatus according to claim 1, wherein the guide is provided in an annular shape and is supported by the support member on a turning axis vertically extending through the isocenter.

11. The radiation treatment apparatus according to claim 1, wherein the support member is fixed to a position closer to the floor than to the isocenter.

12. The radiation treatment apparatus according to

claim 1, wherein the support member is fixed to a position closer to the ceiling than to the isocenter.

13. The radiation treatment apparatus according to claim 5, wherein the support member has a drive unit, which rotates the guide about the turning axis, at a location where the guide is rotatably supported.

14. The radiation treatment apparatus according to claim 6, wherein the support member has a drive unit, which rotates the guide about the turning axis, at least at one of locations where the guide is rotatably supported.

15. The radiation treatment apparatus according to claim 2, wherein the movable member has a drive unit that moves by holding a belt provided on an outer peripheral side of the guide.

16. The radiation treatment apparatus according to claim 1, wherein the radiation generating unit has a variable collimator having a window, which can change a shape, for emission of radiation.

17. The radiation treatment apparatus according to claim 1, further comprising an imager that acquires information of a radiation transmission image of an area including the isocenter.

18. The radiation treatment apparatus according to claim 17, wherein the imager includes a plurality of radiation sources for acquiring the radiation transmission image, the radiation sources emitting

radiation crossing at the isocenter, and detectors paired with the radiation sources, the detectors detecting the radiation that has been emitted from the radiation sources and has passed through the isocenter.

19. The radiation treatment apparatus according to claim 17, further comprising a control unit which controls two axes of the movable member that rotatably supports the radiation generating unit, on the basis of the information acquired by the imager.

20. The radiation treatment apparatus according to claim 17, further comprising a variable collimator that alters a cross-sectional shape of the radiation emitted from the radiation generating unit, and a control unit that alters the shape of a window of the variable collimator to emit the radiation on the basis of the information acquired by the imager.

21. The radiation treatment apparatus according to claim 17, wherein the imager is an X-ray CT scanner.

22. The radiation treatment apparatus according to claim 1, further comprising a microwave source which supplies microwaves to the radiation generating unit via a waveguide, the microwave source being positioned apart from the movable member and the guide.

23. The radiation treatment apparatus according to claim 1, further comprising a movable table that positions an object of radiation within a range including the isocenter.

24. The radiation treatment apparatus according to claim 23, wherein the movable table has a slide board on which the object of radiation is placed, and a drive mechanism that moves the slide board along three orthogonal axes.

25. A radiation treatment apparatus comprising:

a radiation generating unit that emits treatment radiation;

a movable member on which the radiation generating unit is mounted;

a manipulator that positions the movable member in a desired direction;

a variable collimator that alters a irradiation field of the treatment radiation emitted from the radiation generating unit;

a diagnosis imager that detects a three-dimensional position and a three-dimensional shape of an object of radiation on which the treatment radiation is applied;

a control unit that controls an emission port of the variable collimator, on the basis of the three-dimensional position and three-dimensional shape of the object of radiation detected by the diagnosis imager and an irradiation angle of the treatment radiation applied to the object of radiation, such that the irradiation field of the treatment radiation emitted from the emission port may vary in a tracking manner in

accordance with the three-dimensional position and three-dimensional shape; and

a 3-orthogonal-axis type positioning unit that positions the object of radiation at the irradiation field of the treatment radiation.

26. A radiation treatment apparatus comprising:

a radiation generating unit that emits treatment radiation;

a movable member on which the radiation generating unit is mounted;

a gantry that rotates the movable member about a patient;

a variable collimator that alters a irradiation field of the treatment radiation;

a diagnosis imager that detects a three-dimensional position and a three-dimensional shape of an object of radiation on which the treatment radiation is applied;

a control unit that controls an emission port of the variable collimator, on the basis of the three-dimensional position and three-dimensional shape of the object of radiation detected by the diagnosis imager and an irradiation angle of the treatment radiation applied to the object of radiation, such that the irradiation field of the treatment radiation emitted from the emission port may vary in a tracking manner in accordance with the three-dimensional position and

three-dimensional shape; and

a 3-orthogonal-axis type positioning unit that positions the object of radiation at the irradiation field of the treatment radiation.

27. The radiation treatment apparatus according to claim 25, wherein the movable member is rotatable about an axis crossing a direction of emission of the treatment radiation.

28. The radiation treatment apparatus according to claim 26, wherein the movable member is rotatable about an axis crossing a direction of emission of the treatment radiation.

29. The radiation treatment apparatus according to claim 25, further comprising a microwave source that supplies microwaves to the radiation generating unit and is provided apart from the movable member, and a waveguide that propagates the microwaves from the microwave source to the radiation generating unit.

30. The radiation treatment apparatus according to claim 26, further comprising a microwave source that supplies microwaves to the radiation generating unit and is provided apart from the movable member, and a waveguide that propagates the microwaves from the microwave source to the radiation generating unit.

31. The radiation treatment apparatus according to claim 25, wherein the diagnosis imager includes:

a plurality of X-ray sources that emit diagnosis

X-rays crossing at the object of radiation;

detectors paired with the X-ray sources, the detectors detecting the diagnosis X-rays that have passed through the object of radiation; and

an analysis unit that finds a three-dimensional position and a three-dimensional shape of the object of radiation, on the basis of the diagnosis X-rays detected by the detectors.

32. The radiation treatment apparatus according to claim 26, wherein the diagnosis imager includes:

a plurality of X-ray sources that emit diagnosis X-rays crossing at the object of radiation;

detectors paired with the X-ray sources, the detectors detecting the diagnosis X-rays that have passed through the object of radiation; and

an analysis unit that finds a three-dimensional position and a three-dimensional shape of the object of radiation, on the basis of the diagnosis X-rays detected by the detectors.

33. The radiation treatment apparatus according to claim 25, wherein the diagnosis imager is an X-ray CT scanner.

34. The radiation treatment apparatus according to claim 26, wherein the diagnosis imager is an X-ray CT scanner.

35. The radiation treatment apparatus according to claim 25, wherein the control unit alters the emission

port of the variable collimator in accordance with a projection area of the object of radiation as viewed from the radiation generating unit, on the basis of the three-dimensional position and three-dimensional shape of the object of radiation detected by the diagnosis imager.

36. The radiation treatment apparatus according to claim 26, wherein the control unit alters the emission port of the variable collimator in accordance with a projection area of the object of radiation as viewed from the radiation generating unit, on the basis of the three-dimensional position and three-dimensional shape of the object of radiation detected by the diagnosis imager.

37. A method of applying treatment radiation, comprising:

detecting, with use of a diagnosis imager, a three-dimensional position and a three-dimensional shape of an object of treatment of a patient positioned within a range of detection of the diagnosis imager;

successively altering a position and a shape of an emission port of a variable collimator that permits passage of the treatment radiation, in accordance with a projection area of the object of treatment as viewed in a direction in which the treatment radiation is applied, on the basis of an irradiation angle of the treatment radiation and the three-dimensional position

and three-dimensional shape of the object of treatment detected by the diagnosis imager; and

successively adjusting a irradiation field of the treatment radiation in a tracking manner in accordance with the object of treatment.

38. A control method for a radiation treatment apparatus having a diagnosis imager, comprising:

detecting, with use of the diagnosis imager, a three-dimensional position and a three-dimensional shape of an object of treatment of a patient positioned within a range of detection of the diagnosis imager; and

successively altering a position and a shape of an emission port of a variable collimator that permits passage of the treatment radiation in order to successively adjust a irradiation field of the treatment radiation in a tracking manner in accordance with the object of treatment, in accordance with a projection area of the object of treatment as viewed in a direction in which the treatment radiation is applied, on the basis of an irradiation angle of the treatment radiation and the three-dimensional position and three-dimensional shape of the object of treatment detected by the diagnosis imager.